(Rock County GRS Abutment Bridge on County Road 55)

State Aid Bridge News

January 2014

Contents:

Bridge Asset Management Update

Bridge data backlog

The Bridge Office has made some changes to the Bridge Data Management Unit in 2013 to help resolve the new bridge data backlog. Two people have been added to the unit, Abigail Niemann and David Hedeen. The MnDOT Fracture Critical Unit has also been helping with the list of new bridges during November, December and January.

The SIMS email notifications for overdue inspections now exempts any bridges still left on the To-Do list. If you receive an overdue inspection email for a bridge that has been replaced, Data Management is not aware of its removal. Please email Abigail Niemann at abigail.niemann@state.mn.us with the old bridge number, new bridge number and date opened to traffic.

Looking forward to 2014, several process improvements will be implemented. The biggest improvement will be the release of the MnDOT Bridge Data Coding Guide. This new coding guide will allow inspectors and program administrators to fully understand the 373 data items in each bridge record. The new coding guide will also pave the way for designers to provide data for new bridges prior to construction, which will be a massive improvement to the current process.

If you have any questions regarding your bridge data backlog please do not hesitate to contact David Hedeen at david.hedeen@state.mn.us or 651-366-4528.

Scour code and culvert fill depths

On several SAPs we have noticed the scour code is missing in the Scour Confirmation Recommendation box on the bridge survey sheet.

The designers are already putting the scour elevation in this box, so please don't forget to add the appropriate scour code as well, please note the scour codes of all bridges in the state must be reported to the FHWA. In creating the report for the FHWA, missing scour codes will report a scour code of F (no evaluation-found) which is unacceptable for a new bridge. Note SALT Bridge will be looking closer to assure all new bridge plans have a score code.

We also have noticed some local culvert plans with a lack of information to correctly calculate culvert fill depths. The culvert plan should show enough detailed information for us to calculate the fill depth and report into SIMS. The plan should show or indicate the culvert profile with inlet and outlet invert elevations, and along the culvert alignment the plan should also show or indicate the top of centerline roadway elevation and roadway cross slope information. We appreciate your assistance with this useful information.

Updating Town Bridge Improvements Costs

The improvement cost data is used to annually apportion the Town Bridge Account funds to

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replace, rehabilitate or remove an eligible township bridge. It is very important that each county review their township bridge improvement cost data annually, any disagreements with the computer generated or manually supplied costs must be updated to assure a fair and proper apportionment is received.

Please submit your cost updates no later than the end of October to ensure the Town Bridge apportionment calculation which is performed in November is based on updated bridge replacement costs. This is the responsibility of each individual agency to complete to ensure your town bridge apportionment accurately represents your replacement costs of deficient town bridges.

Revise and mark up printed copy of Improvement Cost Worksheet as needed and send to Lisa Hartfiel at lisa.hartfiel@state.mn.us or 651-366-4557, or Thomas Martin at thomas.martin@state.mn.us or 651-366-4556.

NBIS Compliance Headlines

Questions regarding these topics can be directed to David Hedeen at David.Hedeen@state.mn.us or 651-366-4528.

All inspection data must be entered and approved no later than February 15, 2014

If you do not meet the February 15 deadline, you will be out of compliance with Minnesota Statute 165.03, Subd.3. The State of Minnesota or MnDOT is ultimately responsible to assure our local agencies are in compliance with NBIS regulations. If any one of our local agencies is found to be non-compliant with the NBIS and proactive steps are not taken to fulfill NBIS regulations, the FHWA could withhold federal aid highway funds from the state. Please contact Thomas Martin at thomas.martin@state.mn.us if you will not be able to meet the deadline.

Certification of Bridge Safety Inspection form still required

The Certification of Bridge Safety Inspection to the Commissioner of Transportation form must be submitted no later than the close of business on February 15, 2014. This document can be signed, scanned, and sent to Lisa Hartfiel at Lisa.Hartfiel@state.mn.us as an e-mail attachment, or fax to 651-366-4497. This form can be found here, along with many helpful resources, can be found on the Bridge Inspection's webpage.

Grace period for 24/48 month inspection frequencies

A one month grace period for 24/48 month inspection frequencies is allowed as long as there is a documented unusual circumstance. A list of structures meeting the criteria will be emailed to program administrators on a form that needs to be returned to the MnDOT Bridge Office. The form will be emailed after the February 15 submission date and will need to be returned by April 1.

Grace period for 12 month inspection frequencies

There is a three month grace period for all 12 month inspection frequencies, unlike the 24/48 month grace period, there is a no additional documentation required to use the three months of grace. If a 12 month inspection frequency exceeds the three months of grace, an additional month is allowed but will now require a documented reason for the unusual circumstance. A list of structures meeting the criteria will be emailed to program administrators on a form that needs to be returned to the MnDOT Bridge Office. The form will be emailed after the February 15 submission date and will need to be returned by April 1.

New NBIS compliance review process

The NBIS compliance review process was overhauled in 2012 to match current federal requirements. Agencies will now be assessed annually based on the data submitted by February 15. Agencies will be issued a letter summarizing their compliance percent and rank annually and expect to see an in-depth review every five years. Additional information on this topic will be presented in the 2014 Bridge Inspection Seminars.

Quality inspections

An important aspect of a quality inspection is the documentation of deficiencies and how they have changed over time. Justification of element conditions shall be recorded in the element inspection comments for all inspection element quantities greater than condition state one (CS1). A quantification of the deficiency shall be made along with the year of the inspection so inspectors can monitor any changes with time. Inspectors shall document that the deficiency was monitored during subsequent inspections and record any change from the initial state. A way to follow this practice is shown by the example below:

[2012-2013] South fascia girder has 15LF of freckling rust starting at west abutment.
[2009-2011] South fascia girder has 10LF of freckling rust starting at west abutment.

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With the implementation of SIMS, inspectors now have the ability to add notes to NBI condition codes. Inspectors should use these fields to track the condition history and justifications for NBI condition codes. Inspectors should date these notes in a similar manner to that of element notes.

Critical deficiencies

A critical deficiency is defined as any condition discovered during a scheduled bridge inspection that threatens public safety and, if not promptly corrected, could result in collapse or partial collapse of a bridge. MnDOT tech memo 11-12- B-04 defines and establishes the process to handle a critical finding. This is a reminder that bridge owners must report the critical finding to the MnDOT Bridge Office within **7 days** of the finding.

Bridges and Structures Training, and Bridge Inspection Webpages

Questions regarding these topics can be directed to Jennifer at Jennifer.Zink@state.mn.us or 651-366-4573.

We encourage you to visit the MnDOT Bridge Office, Bridges and Structures Training webpage for the latest training opportunities. This webpage also includes video tutorials and a link to MnDOT's YouTube channel. The training page currently shows training opportunities in bridge maintenance, and registration information for the Bridge Safety Inspection Refresher Seminars. The current video tutorials are on low slump wearing, reinforcement/concrete placement, test pile driving, and special surface finish.

Another extremely valuable webpage is the Bridge Inspection webpage. This webpage includes links to manuals of bridge inspection best practices, important related tech memos, reports/forms, training/certification, SIMS access tutorials and reports, and a link to electronic bridge plans

Bridge Inspection General

Questions regarding these topics can be directed to Peter Wilson at Pete.Wilson@state.mn.us or 651-366-4574.

2014 Bridge Safety Inspection Refresher Training Seminars

February 6 - Blaine, MN
February 13 - St. Cloud, MN
February 20 - Carlton, MN
February 27 - Detroit Lakes, MN
March 13 - Rochester, MN
March 20 - Mankato, MN
March 27 - St. Paul, MN

To maintain MnDOT certification as a bridge safety inspection, program administrator or team leader, attendance is required at a minimum of two bridge inspection seminars during each four year recertification period. However, those who are not required to attend are welcome and encouraged to attend.

For registration questions contact Ashley Knudson, University of Minnesota at cceconf2@umn.edu or 612-624-4754.
For curriculum questions contact Pete Wilson at pete.wilson@state.mn.us or 651- 366-4574

Snooper rental policy

Snooper use is available for local agency bridge inspections. Access for inspection is a critical component to properly inspect a bridge. Bridge inspections are enhanced when access is achieved. A snooper rental policy has been established by the Bridge Office to provide local agencies with this access. This policy is listed below.

County/local snooper rental procedures through the MnDOT Bridge Office

1. Snooper schedule must be checked first for availability through Farrell Potter or Scott Theisen. Priority for snooper time is given to Fracture Critical and MnDOT District inspections first. Note, the sooner Farrell or Scott know the date a local agency wants to rent the better! (Please

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reserve the date you want, even if you don't need it until later in the year)

2. All information related to the rental must be sent to Farrell Potter or Scott Theisen for approval. Relative information includes: local agency contact information; dates and times of rental; MnDOT designated snooper operator and driver; reason for snooper usage. The snooper should NOT be used for maintenance that has potential to damage the bucket or the arms.

3. ONLY MnDOT bucket operators are to operate MnDOT snoopers. The respective district in which the county or city resides (or MnDOT Bridge Office if available) will provide an operator based on availability of staff. District or Bridge Office staff will also assist the snooper drivers with lodging, vehicle arrangements, and overnight snooper parking as needed.

4. Traffic control must be provided by the local agency.

5. The snooper driver and operator will charge time, expenses (which includes lodging, meals, etc.), District vehicle usage (if applicable) and snooper equipment usage to the county/local charge ID. As of 8/18/2008, the amount/hour for snooper rental was $118/hour. FY 2012 rate is $5.09/mile. The Bridge Office will still continue to bill at the $118/hour however. The MnDOT Finance Department will ultimately make the determination what to bill based on job numbers that are flagged.

6. 30' snooper exception - local agencies will NOT be charged a rental fee since this snooper was paid for by State Aid. Snooper operator and driver will still charge their time and expenses to the local agency.

7. If an agency decides to hire a consultant to perform the inspections, the consultant will need to sign a waiver.

8. For additional information please reference MnDOT's Inspection Vehicle Policy Manual.

Snooper Rental Contact Persons

Farrell Potter: 651-366-4471
Scott Theisen: 651-366-4475

Bridge Maintenance

The SIMS Maintenance Module was updated in December for MnDOT district users. Additional discussions with local agency representatives will commence in spring to determine how the module may be used outside MnDOT.

Bridge Maintenance Academy I and II training sessions are open to local agency participants in 2014. Bridge Maintenance Academy I (January 13 – January 17) is a classroom session that provides bridge maintenance workers a background in bridge components, bridge elements, design concepts, plan reading, concrete, safety, traffic control and an introduction to bridge maintenance. Bridge Maintenance Academy II (February 10 – February 14) is hands-on training, including forming, tying rebar and pouring concrete for slabs and abutments; detecting, removing and patching delaminated areas; installing stiffeners on structural steel members; as well as classroom presentations on formwork, structural steel and shotcrete. Training information can be found at the following link http://www.dot.state.mn.us/bridge/training.html.

County Authority to Post/Close Township Bridges

Back in October of 2012 the MCEA Bridge Committee met to discuss appropriate county action when townships do not load post or close their bridges when recommended by the county. Is the county required to take action if the township does not? Does the county have the legal authority to compel the township to take action or do the work itself? The current related statute 165.12 did not appear clear. It was apparent we needed to meet with the township organization and discuss the problem and alternative solutions to ensure state and county compliance with federal bridge inspection regulations, and to seek revised legislation.

In December of 2012 we met with Kent Sulem, MAT attorney to help draft some proposed changes to the statute language 165.12 for consideration and discussion with the township association board and the MCEA Bridge Committee at the January 2013 County Engineers Winter Conference. Also it was acknowledged there could be some opportunity for education of both township folks and county engineers with this topic. With the help of several county engineers across the state, related training was provided at the Township Supervisors Training in June of 2013. To

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assist the volunteer county engineers with this training, a short handout was developed by the MCEA Bridge Committee that reviewed why township bridges are inspected, inspection responsibilities, counties assistance with township bridge replacements, why a county recommends a bridge be posted or closed, what happens if a township does not comply with county recommendations to post or close a bridge, and that township bridges in Minnesota are a partnership. The handout also noted that townships almost always carry through with county recommendations – but if not, current law on county authority is not clear. Also within the handout was current and proposed draft language for statute 165.12.

In December, the MCEA Bridge Committee held a special meeting to reconvene with Kent Sulem to discuss the final version of the proposed statute which included almost a year of input and coordination from various county engineers, MnDOT Bridge Office, MCEA Bridge Committee, and the MAT. Note, AMC supports clarifying County authority to evaluate, post and close township bridges if the township does not take action. The proposed Legislation is included in the draft MnDOT Housekeeping Bill. If you would like to see the subject legislation please contact MCEA Bridge Committee Chair, Alan Forsberg at Alan.Forsberg@blueearthcountymn.gov.

Local Timber Bridge Research Update

As you recall the University of Minnesota Duluth, in cooperation with Iowa State University, USDA Forest Products Laboratory, and HDR Engineering, is developing advanced timber bridge inspection procedures for NBIS. The project is focused on improving inspections of timber bridges in Minnesota and Iowa which will result in improved assessment information that can be used to improve the safety and reliability of timber bridges. Please reference last year's State Aid Bridge News for pertinent project background information.

Since the last time we reported on this research project, a lot has been accomplished. We have had several meetings with the technical advisory panel (TAP), and held a special TAP meeting in November at the Alamco glue laminated timber manufacturing plant in Albert Lee, MN. This TAP meeting was well attended. It included a plant tour of Alamco, progress reviews of the timber inspection procedures and Timber Bridge repairs research projects, and an opportunity to have hands on demonstration/training of the advance timber bridge inspection tools.

The project is now in the planning stages to conduct statewide one-day inspection training seminars. The training will be based on the new timber bridge inspection field manual developed in the research, and participants will receive hands on one day practical experience with the inspection procedures and inspection tools and equipment. The training is being specially developed for local bridge inspectors, and program administrators. We're currently planning to conduct the classes in April or May and anticipate the class will be offered in four locations across the state.

Also we're working with the MnDOT Research Services Office, LTAP, and the researcher Brian Brashaw to develop similar training videos for future reference. Brian is currently working through the economics of the proposed inspection protocols. The economics will look at the inspection/reporting time with the advanced inspection tools/protocols and the benefits derived from this more thorough inspection approach, items such as: reduced probability of bridge failure, extended service life, detailed load ratings, and other economic criteria will be looked at.

Brian has summarized several models, advantages/disadvantages and costs for the advanced inspection tools. The two primary tools recommended include a stress wave timer and a resistance micro drill. These specialty tools are used to locate and quantify internal timber decay. There are continued discussions on how to fund the purchase of inspection tools and how to manage their availability for statewide use. As Brian initiates the development of the final research report, training, and inspection tool planning and implementation discussions will continue.

Project updates will be located on a special website that is being developed for the project and hosted at the University of Minnesota Duluth. For more information, or to become involved in the project, contact Brian Brashaw, University of Minnesota Duluth at bbrashaw@nrri.umn.edu or 218-720-4248.

LRRB development of cost-effective timber bridge repair techniques for Minnesota

The cost-effective timber bridge repair project is also progressing along. This research project was born from the recognition of local timber bridge owners that several types of timber bridges that are in need of repair and maintenance. The approach to this research project is to identify the state-of-the-practice of timber bridge repair through a national and international search and to marry those repair techniques with the needs of our local timber bridge owners. The effectiveness of those techniques will then be evaluated from both engineering and fiscal perspectives.

At the special meeting mentioned above, we also conducted a TAP meeting on cost-effective timber bridge repairs. This specific research is being done through Iowa State University Bridge Engineering Center. The primary researcher is Brent Phares, Co-Director at the National Center for Wood Transportation Structures. The research consists of eight tasks with a final report to be completed in November 2014. To date, task 1 and

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2 are fully complete. These tasks included a national search on state-of-the-practice and state-of-the-art in timber bridge repairs. The search also included a Minnesota county Engineers survey to discover what timber bridge repair techniques they're employing, if any. The search included interviews with the county engineers. Because our primary concern has been the deterioration of timber substructures, repairs of timber piling and timber pile caps have been the focus of this research.

Also included in these tasks is a complete understanding of the common timber bridge types and types of deteriorations observed in Minnesota. With this understanding the research team determined which repair approach would be most effective for the known problem. Based on the survey and as we suspected the typical observed deterioration are biological (bacteria, fungi, and insects) and the timber bridge components that most often require repairs are the timber piles. Some of the suggested pile repairs include concrete jacketing, FRP composite shield with polyurethane grout encasement, timber fishplates (bolted splice plates connecting new pile section to original pile), steel splice plates, etc. These repairs have been effective solutions and tested in the lab. The next tasks which are well on their way include the development of cost projections for the repair strategies, and a timber bridge repair manual will be prepared.

Advance timber inspection tools demonstration & training at Alamco Wood Products in Albert Lee, MN

For more information, or to become involved in the project, contact Brent Phares, Iowa State University at bphares@iastate.edu or 515-294-5879.

2013 International Conference on Timber Bridges

With an extended amount of research on timber bridges the last several years it was discussed to send SALT Bridge and a few county engineers to the 2nd International Conference on Timber Bridges in Las Vegas. The LRRB sent Dave Conkel, State Aid Bridge Engineer, Greg Isakson, Goodhue County Engineer, and Bruce Hasbargen, Beltrami County Engineer. Also in attendance of the conference were our researchers on the Advanced Timber Bridge Inspection Procedures, and the Development of Cost-effective Timber Bridge Repair Techniques for Minnesota.

The conference included technical sessions on bridge inspection, wood/concrete bridges, glulam bridges, load testing, covered bridges, field monitoring, bridge durability, and wood composites. The featured presentations were on timber bridge systems that have been most popular, current trends, and making predictions for the future prospects and challenges of the timber industry. We also learned about current trends and future direction of Norwegian timber bridges.

The underlying theme in many of the presentations was that the main cause of timber bridge deterioration is exposure to moisture. In Europe, they will place a protective layer of copper over the top of their wood members as a form of water proofing. They are working to achieve a 100 year life cycle for timber bridges by protecting the primary structural members and at susceptible timber connection locations, scuppers, etc.

Greg Isakson, Goodhue County Engineer noted that a major topic discussed in the bridge inspection seminars was repairing rotted piles that were destroyed by the constant presence of moisture. Options to repair these damaged piles included: driving a new pile next to the failed pile, replace damaged pile section with a short H pile of the same length, wrap the failed timber pile with metal culvert, and fill the void with concrete, pour a spread foot around the old piles and stand a section of new pile between the new footing and the pile cap, or if several or all of the pile in an abutment are failed, then drive new piling outside the deck and span a steel beam between them to basically bypass the failed abutment.

A problem with treated timber is that the treatment doesn't get all the way to the middle of the timber member. Many times the outside of the timber looks great, but it can be rotting from the inside out. At the conference German company, Rinntech had a device called a Resistograph that drills a 3 mm hole into a member and records the amount of resistance it takes to advance the drill bit. This resistance is then plotted. In a member that is rotted on the inside but treated on the outside, the resistance to get through the outer layer is high and then very low in the middle since there is little resistance from the rotted wood. This tool will help show how much of the member is solid and how much is rotten.

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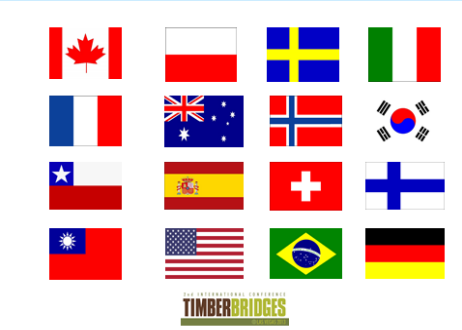
This would be a useful tool to have available for local bridge inspectors, since inspections are typically limited to a visual inspection, and sounding with a hammer. Please see the article on Local Timber Bridge Research Update (pg. 5-6) for further discussions on advanced timber bridge inspection tools.



Another interesting timber product presented at the conference was fiberglass wrapped glu-lam timber bridge deck and abutment sections. A Canadian company gave a presentation on these innovative deck sections. With a pre-poured footing ready, they can come in and place the pre-fab timber abutments and set the pre-fab deck panels, install railing and finish up in a day or two. As you can see there is a world interest in the inspection, repair, and construction of timber bridge material.

Visit the conference on the National Center for Wood Transportation Structures website to learn more, and for all of the conference presentations.

Geosynthetic Reinforced Soil Abutment Bridge

Minnesota's first ever geosynthetic reinforced earth abutment Bridge was constructed in Rock County this year! In our January 2013 State Aid Bridge News we discussed the GRS technology and Rock County's pursuit of a GRS abutment bridge demonstration project. As you recall the site selected for this project was Rock County Road 55 over a short line railroad. Although the site is over a dry crossing, eliminating any abutment scour concerns, managing the roadway geometry was somewhat challenging. The site called for a 22' vertical clear over the RR tracks, and a relatively short approach distance between the proposed end of bridge and intersecting CSAH 4. These site constraints lead to steeper grades (5.3%, largest grade for a GRS abutment to date) and ultimately FHWA's Research Evaluation Program to seek long term monitoring of the bridge to expand the scope of practice for GRS abutments.

The bridge is scheduled to be monitored into year 2016 with the objective to investigate the impact of grade on the performance of the GRS abutments, measure the deformation and compare to other current in-service structures, and to quantify the ride-ability. The results will be used in updated GRS abutment design and construction guidance which will ultimately help transportation agencies make decisions on appropriate design requirements for the GRS abutments. The instrumentation and monitoring program was realized through the excellent work of the MnDOT Foundation Office, FHWA, BARR Engineering, Minnowa Construction, Inc., and Rock County. We encourage you to visit the Rock County GRS-IBS project website, login: MNDot (M,N,D are capitalized) password: rock ('0' is a zero) and website works better with Safari, Chrome, or Firefox. The site includes a webcam, real time and historical horizontal and vertical displacement data, and associated displacement graphs.

With all of the excitement of Minnesota's first GRS abutment bridge, a national showcase was developed specifically for the Rock County GRS abutment bridge. The bridge was designed by Erickson Engineers, and constructed by Minnowa Construction, Inc. The showcase was developed by Rock County, SALT Bridge, MnDOT Foundations Office, and the FHWA. The showcase discussed GRS technology, performance, construction considerations, project overview, and included a field trip to the bridge site. The showcase drew around 40 participants from five states, mostly engineers. You can watch this video for a nice recap of the showcase and the advantages of GRS technology.

FHWA/MnDOT/Rock County GRS-IBS Showcase

Through the FHWA's Every Day Counts initiative, GRS abutments are being rapidly deployed across the country, with about 100 in design or construction to date. GRS can reduce construction time, abutments can be constructed in three days, as compared to a week or more for a conventional concrete single line pile bent. No heavy equipment or specialized labor is needed. GRS can lower material and labor costs, with abutment cost savings of 25-60%. GRS can also potentially reduce maintenance costs, there are no bridge joints to maintain, the technology eliminates the bump at the end of the bridge, creating a smoother and safer transition, and GRS technology is extremely durable.

Please work with your local bridge consultant during the bridge type study phase to assess the potential to implement GRS abutments. You can also contact SALT Bridge Office and Minnesota FHWA for relevant information and assistance with GRS implementation.

Local Historical Bridge Preservation Update

Local Historic Bridge Study Phase II

In our last issue we referenced the Local Historic Bridge Study Phase II was under contract development. This study is now well underway with the consultant team of LHB, Mead and Hunt, and the 106 group performing the study under the lead of the MnDOT State Aid Office with joint administration from the MnDOT Cultural Resources Office and State Aid Bridge Office. This study builds upon the findings and results of the Phase I Local Historic Bridge Study. One of the studies goals is creating an individual report for each historic bridge which will serve to inform interested owners concerning the historical background, current condition, administrative and regulatory processes and opportunities concerning their historic bridge. The study will also result in a comprehensive understanding of the financial needs to maintain and preserve the bridges and can be used as a source to attempt to procure future funding for projects which advance.

There are approximately 135 historic bridges within the study group. For the study's bridges, the team is in the midst of completing historic research and documentation, performing field assessments to gather historic and existing condition information, and preparing written documentation of the findings in individual bridge reports. These individual bridge reports create a comprehensive documentation of the bridges historic context, condition, maintenance, stabilization and preservation needs. Also within the reports are estimated engineering and construction costs to complete the recommended maintenance, stabilization and/or preservation work.

To date, the team has completed the field work on approximately 80% of the bridges and is approximately 30% complete with preparation of the individual bridge reports. The team has reported that all owners contacted to date have been very helpful in sharing and making available any of their records which has been much appreciated. As individual bridge reports are finalized they will be shared with the bridge owners for their review and comment. In addition the project team intends to hold a series of statewide meetings to spend time with the owners of the historic bridges and other interested parties to share information the team has learned and hear from and respond to the owners in regards to their concerns, information needs, and processes faced when considering a project involving their historic bridges. The project is scheduled for completion at the end of June.

Major Local Historical Bridge Projects

Franklin Avenue Bridge: Hennepin County Road 5 over West River Parkway and the Mississippi River in Minneapolis. The Franklin Avenue Bridge (also known as the Cappelen Memorial Bridge) was completed in 1923; the bridge was considered to have the longest concrete arch in the world. The bridge was added to the National Register in 1978, The Bridge's overall length is 1054.7 feet, with a central span of 400 feet. The bridge is scheduled for a $21 million renovation by Hennepin County beginning next fall. The renovation will include a new deck, rebuilt railings, the installation of historically appropriate lighting, repaired arches and piers, and a widening of the east side of the bridge. The County has also proposed that the renovation include a redesign of the bikeway on the bridge, allowing for a protected cycle track.

Cappelen Memorial (Franklin Ave) Bridge

North Town Bridge (formerly St Anthony Parkway Bridge): City of Minneapolis St. Anthony Parkway over North Town Yard. The project includes the removal and replacement of a five-span, Warren through truss over 24 tracks of the Burlington Northern Santa Fe Rail Yard with a new bridge. The new bridge design calls for a combination approach, with the western portion having an innovative load path redundant through -truss structure similar in appearance to the existing bridge, and the eastern portion supported by piers and steel girders. The bridge replacement has an estimated construction cost of about $28 million and is scheduled for a letting in April.

10th Avenue Bridge: City of Minneapolis 10th Avenue over the Mississippi and in the proximity of the University of Minnesota. The project proposes to rehabilitate the historic 10th Avenue Bridge. The bridge was constructed in 1929; the bridge is an open-spandrel arch bridge type and carries a four-lane roadway and a sidewalk. It had previous rehabilitation work in 1972 & 1976, and a new wearing surface placed in 2001. This project will further preserve the bridge by repairing deteriorated concrete areas on the spandrel columns, floor beams, and arches. If the structure is allowed to continue to deteriorate, rehabilitation will no longer be cost effective, and total structure replacement of this bridge is expensive. The final bridge rehabilitation estimated construction cost depends on the final scope of the rehab work. It's anticipated that the bridge will need approximately $15 million in repairs. The current project schedule calls for a construction start date 2014-2015.

2013 MnDOT/AGC Local Bridge Construction Awards

The winners for the 2013 MnDOT/AGC Bridge Construction Awards have been selected. We would like to congratulate the local bridge consultant, AGC Contractor, and Kittson County for being selected as winner for bridges in the cost category below $1.5 million. The winner is Bridge Number 35537 which carries CSAH 1 traffic over Kennedy Coulee. The bridge was designed by Erickson Engineering and constructed by Swingen Construction Company.

Award winners will be honored at the 2014 MnDOT/AGC spring meeting usually in early May at the AGC office. A brief presentation of the projects will be made by the State Bridge Engineer and award winners will be recognized. Plaques and project photos will be presented to each member of the winning teams and group photographs will be taken.

The rating panel found numerous examples of high quality workmanship on the reviewed bridges, and we encourage local bridge owners to continue to strive for excellence in bridge construction on all of your projects. We look forward to seeing bridges from your local agency in future submittals.

Kittson County Bridge 35537, CSAH 1 over Kennedy Coulee

2014 MnDOT Standard Specifications for Construction

In August, we directed our local bridge consultants to implement the new 2014 spec book for all projects let on or after December 2, 2013. Note, the December date was per MnDOT tech memo 13-15-TS-05. We wanted our local bridge consultants to adhere to the guidelines of this tech memo as MnDOT's standard bridge details are now updated for the 2014 specs, all MnDOT bridge special provisions (Special Provisions Division SB) have been updated for 2014 specs, and most importantly the Bridge Office construction support staff is now geared up to support bridge projects using the 2014 specs.

A few other important reasons for your local bridge consultants to use the 2014 specs, is that the 2005 bridge special provisions are now outdated, there are many positive changes from the 2005 to 2014 specs, and many of your consultants design both local and state bridges. Allowing them to prepare bridge plans using one specification between state and local projects will eliminate confusion and possible errors. Also, note our AGC bridge contractors are fully aware of the new 2014 specs, and are ready to start constructing state and local bridges this construction season using the new spec.

However, in November State Aid issued tech memo 13-SA-02, Implementation of the MnDOT Standard Specifications for Construction, 2014 Edition, which states that the 2014 spec must be used for projects with construction activities begin in 2015 or later, or projects turned into SALT after November 1, 2014. We understand this tech memo was developed in order to provide local agencies a little more time to adjust and prepare plans using the 2014 specs. This memo is good in that it will allow some of the local bridge plans prepared using the 2005 specs and still waiting funding to be used, preventing significant consultant plan and specification rework.

At this time, we can say that a majority of the local bridge consultants are preparing plans with 2014 specs, and are using related bridge pay items, bridge standard details, and special provisions for lettings this year. In some cases we're seeing local projects which included both roadway and bridge construction being developed so the roadway portion uses 2005 specs and the bridge portion uses 2014 specs. In another case a local agency let a bridge last year using 2005 specs with construction to start this spring, and their bridge consultant is currently preparing bridge replacement plans for another bridge in close proximity also for this construction season. To eliminate any confusion their bridge inspectors may encounter using two different specs 2005/2014 between the bridges, they opted to stay with the 2005 specs for the bridge currently being designed.

As you can see we may have certain situations where staying with the 2005 specs is advantageous for the local bridge owner and still meets the SALT tech memo above. When you're developing local bridge projects, please try to start with the 2014 specs for the important reasons as stated above. If you're still considering the use of the 2005 specs within the requirements of the SALT tech memo, please contact SALT Bridge and your bridge consultant to discuss the best course of action. In any case, as we move forward we encourage you and your bridge consultants to implement the 2014 specs as soon as possible!

MnDOT Bridge Standards Unit Update

If you're a local bridge consultant you have come to learn that MnDOT's Bridge Standards are constantly changing, evolving, and being updated to stay current with national trends, codes and specifications. We're fortunate to have an excellent Bridge Standards Unit under the direction of Paul Rowekamp. Paul and his staff work hard with the Bridge Office Research and Development Committee, and the Structural Standards Review Committee to implement the latest technology and improvements into MnDOT's Bridge Standards. Note, SALT Bridge serves on the SSRC to advise and offer input from a local bridge perspective. Below are just a few notable standard changes in 2013. When developing bridge plans you should always visit/revisit the Bridge Standards and Research website for the latest bridge standard plans and details.

Precast concrete box culverts: In April of 2013 the culvert standards were updated to convert reinforcing bar marks from metric to US customary bar designations. Then in November of 2013 the culvert standards were again updated to reference epoxy coated reinforcement in the distribution slab, changed "H" to "Rise" & "W" to "Span", along with several other tweaks to the details, tables, constructions notes, etc. These changes were born from additional input and approval from our local culvert precasters, MnDOT Bridge Office, etc. If you're interested in the complete revision log of the culvert standards please reference the Standards Plan Manual, Box Culverts .

For those local agencies interested in the 11/6/2013 culvert standard plans in AutoCAD version 2004 format, please contact the SALT Bridge Office. We would like to thank WSN Consulting Engineers for converting these drawings from MicroStation to AutoCAD format. The 2004 format should be able to be used by any agency running AutoCAD 2004 or later. Please reference the Standards Plan Manual - Box Culverts webpage for PDFs to assist in checking for any possible conversion errors.

Conversion from metric to U.S. customary rebar designations: In April 2013 MnDOT updated the Standard Plates Manual, Standard Plans Manual, Bridge Details Manual Part I, Bridge Details Manual Part II, to reflect U.S. Customary rebar designations. Several other revisions to the MnDOT's standard bridge details happened in 2013. We encourage you to visit the complete revision log of the Bridge Details Manual Part I and Bridge Details Manual Part II for a listing and date of these revisions.

Three-sided precast concrete bridge structures: Pretek was added to the list of pre-qualified suppliers of three-sided arch top structures in 2013. They call their structure the Eco-Span. We now have three suppliers of three-sided arch top structures, Conspan, Cretex, and Eco-Span. For technical assistance with three sided structures please contact Khalid Obeidat at khalid.obeidat@state.mn.us or 651-366-4485.

Pile Corrosion Immediately Below Footings

There have been a number of recent examples where bridge piles have exhibited significant corrosion immediately beneath a footing, including; the I-43 bridge in Green Bay, several local bridges in Winona County, and Nine Mile Creek bridge in the southwest metro. Also, significant corrosion has been found at and above the ground line on pile bent pier piles on bridge 69887 (I-35 in Duluth). Work is also underway by the Iowa DOT to address this issue. A small subcommittee in the Bridge Office will be formed to address this issue and will report back to both the Structural Standards Review Committee and the R&D Committee with their recommendations. The subcommittee is scheduled to meet at the end of January. They will be reviewing some results of work done by Iowa.

In May of 2013 Winona County informed us of issues with deterioration of steel H piling under concrete abutments. According to Winona County, over the life of the bridge either the ground under the abutment settles, or it washes out and is filled back in, leaving an air/soil interface under the abutment and a place for pile corrosion and deterioration to take place. David Kramer, Winona County Engineer did a nice job documenting their corrosion problem, and a solution to protect future steel H piling from corrosion. Dave's steel H pile corrosion protection detail calls for encasing approximately 5' of H pile below the concrete abutment with a steel pile shell filled with concrete.

Winona County issues with deterioration of abutment pile. Photo shows corrosion eating away steel H piling under concrete abutment

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…continue, Pile Corrosion Immediately Below Footings

Until we heard from David Kramer, SALT Bridge & the Bridge Office were not aware of steel pile corrosion below concrete abutments. Ironically, about six months later pile corrosion resulted in failure and temporary closure of an interstate bridge in Wisconsin, and temporary closure of a state bridge in Duluth. Regarding our common Minnesota local bridge supported on steel H pile, any soil settlement and air voids below the concrete abutments are probably rarely seen because the riprap may be hiding the problem. Perhaps this concern might warrant us to look at our integral abutment details; possibly we should be providing additional soil cover at the base of the concrete abutment stem, and/or maybe some additional geotextile around the abutment stem to retain the soils better.

In 2010, Iowa looked at several highway bridges to determine the condition of steel abutment piles. Unfortunately, during the bridge inspections, they too observed corrosion at upper portions of steel piles, where erosion has created voids between the soil and the bottom of the abutment concrete. They noted that corrosion was significantly more severe at pile segments that were located above the grade line, compared to portions that were covered. In 2011, Iowa looked into some possible steel pile coating systems for lab and field testing. Coating systems such as bituminous mastic, non-shrink grout (pile encapsulation with grout), thermally sprayed aluminum coatings, etc. were identified for further evaluation. As stated above, the MnDOT Bridge Office will be looking into Iowa's past studies and reports, etc. to help formulate some statewide guidance in the near future on steel pile corrosion.

Pre-fabricated Pedestrian/Bicycle Bridge Superstructures Update

Since the new tech memo 11-03-B-01 , Use of Performance Specifications for Pre-fabricated Pedestrian/Bicycle Bridge Superstructures was approved and issued on 6/28/2011, there have been almost 20 pedestrian bridge projects that have come through our office for review incorporating the new tech memo.

The use of the new tech memo and the associated special provision boiler plate has been going rather well overall. One of the main changes from the old tech memo is that the review responsibility of the pre-fabricated bridge superstructure plans and calculations has been essentially turned over to the owner's bridge consultant. There have been several of your local bridge consultants that have been involved in one or more of these pedestrian bridge projects over the last 2 ½ years. Although we have provided guidelines for review of the fabricator's superstructure plans on our website, inevitably each consultant will provide his own level of review of the plans and calculations. For this reason, the State Aid Bridge unit still may provide a discretionary oversight review of the project.

The following informational documents are found on the State Aid Bridge Information and Resources webpage to help explain the submittal and review process and clarify the responsibilities of all parties involved.

- Special provision boiler plate for pre-fabricated pedestrian/bicycle bridge superstructure
- Submittal and approval process for pre-fabricated pedestrian/bicycle bridge projects
- Guidelines for superstructure plan review for pre-fabricated pedestrian/bicycle bridges
- Pre-Fabricated Pedestrian/Bicycle Bridge Project Submittal and Review Requirements
- Tech memo 11-03-B-01, Use of Performance Specifications for Pre-fabricated Pedestrian/Bicycle Bridge Superstructures

Through these first couple years of use of the new tech memo, working with the various consultants involved, there have been several improvements and updates to the information we have provided on our website that have been noted/suggested. We are working on updating this material in the near future. If you have any questions or comments regarding any of these documents, please call or e-mail Brian Homan, State Aid Bridge Plans Engineer at brian.homan@state.mn.us or 651-366-4494 .

Bridge Costs Update

Calendar year 2013 saw a small unit cost increase for PCB type structures and a small unit cost decrease for the C-SLAB type structures. These two structure types account for the majority of local bridges. As is usually the case, the C-SLAB structure type is the lowest unit cost structure on the local system.

We also let a single C-ARCH (3-sided concrete arch structure, supplied by CONSPAN) in CY 2013, which came in at about $486/sf.

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…continue, Bridge Costs Update

We let two steel pedestrian TRUSS structures in CY 2013, but their cost was unusually high for this structure type. It was difficult to determine the reasons behind the high price tags for these two bridges.

There was a pronounced increase in the number of C-SLAB bridges compared to CY 2013 (39 let in CY 2013 vs. 24 let in CY 2012). We let the same number of PCB bridges compared to CY 2012 (28 let in CY 2013 vs. 29 let in CY 2012). The unit cost percentage increases/decreases are shown below.

PCB structure costs were up 4% ($125.39/sf in CY 2012 vs. $130.44/sf in CY 2013)

C-SLAB structure costs were down 2% ($112.60/sf in CY 2012 vs. $110.91/sf in CY 2013)

TRUSS pedestrian structure costs were up 54% ($149.83/sf in CY 2012 vs. $322.73/sf in CY 2013)

We replaced approximately 81 timber bridges and 6 fracture critical bridges in CY 2013. Timber bridges are considered to be of full timber construction or timber pile/abutment construction. The fracture critical bridges were low truss or high truss steel bridges.

Of the 81 timber bridges replaced in CY 2013, 44 of them were replaced with concrete box culverts, 23 were replaced with C-SLAB bridges, 13 were replaced with PCB bridges, and 1 was replaced with a C-ARCH bridge.

Of the 6 fracture critical bridges replaced in CY 2013, 1 of them was replaced with a C-SLAB bridge, 2 were replaced with PCB bridges, and 3 were removed as road-in-lieu projects.

Please visit our Bridge State Aid Information and Resources webpage. You can locate our Annual Bridge Cost Reports on this web page. The Annual Bridge Cost Report shows cost reports per local bridge structure type, a summary table of local bridge structure type cost history, a cost report for local bridge structure lengths less than 150 feet, cost report for local bridge structure lengths greater than 150 feet, and a cost summary table for all local bridges

Local Bridge Replacement Program Update

State Bond Funds: The 2012 Legislative session appropriated $30,000,000 in bond proceeds from the state transportation fund for local bridge replacement and rehabilitation. This bond account is depleted and all funds are accounted. Bridge projects submitted to the District State Aid Offices for final plan approval will be put on a bridge funding waiting list. If additional bridge bond funds become available through the passage of a bonding bill during the up-coming legislative session, the 2014 federal bridge projects and those on the waiting list with approved plans will have first priority for the funds.

Summary of bond funds:

2012: 267 local bridges were replaced, rehabilitated, or removed at a total cost of $97,490,777. This included $7.1 million in federal, $23.8 million in state aid, $14.4 million in township, $7.4 million in local, and $44.8 million in bond funds. Township bridges accounted for 82 of the 267 bridges. Average cost of township bridge project was $195,374 and average cost of a bond funded project was $265,876.

2013: 162 local bridges were replaced, rehabilitated, or removed at a total cost of $77,965,189. This included $13.8 million in federal, $13.7 million in state aid, $12.6 million in township, $6.3 million in local, and $31,512,719 million in bond funds. Township bridges accounted for 56 of the 162 bridges. Average cost of township bridge project was $224,665 and average cost of a bond funded project was $308,430.

Town Bridge funds in the "special" or unallocated town bridge account are also depleted. Counties do have the option of advancing regular town bridge funds or waiting until January when the apportionment from the Highway User Tax Distribution Fund is distributed to the counties and replenishes the special town bridge account.

The bridge fund waiting list as of 1/1/2014 has approximately 15 projects requesting $2.3 million of bond funds and $800,000 of town bridge funds.

At this time, the number of local bridges identified for replacement on the master bridge replacement priority list utilizing all funding sources for 2013/2014 totals 737 bridges with an estimated total replacement cost of $ 247,035,045.

Agencies should update their bridge priority list annually by submitting a county board or city council resolution following the guidance and resolution format on the Local Bridge Replacement Program webpage. This information helps demonstrate the need and justification for funding the local bridge replacement program in the upcoming legislative session.

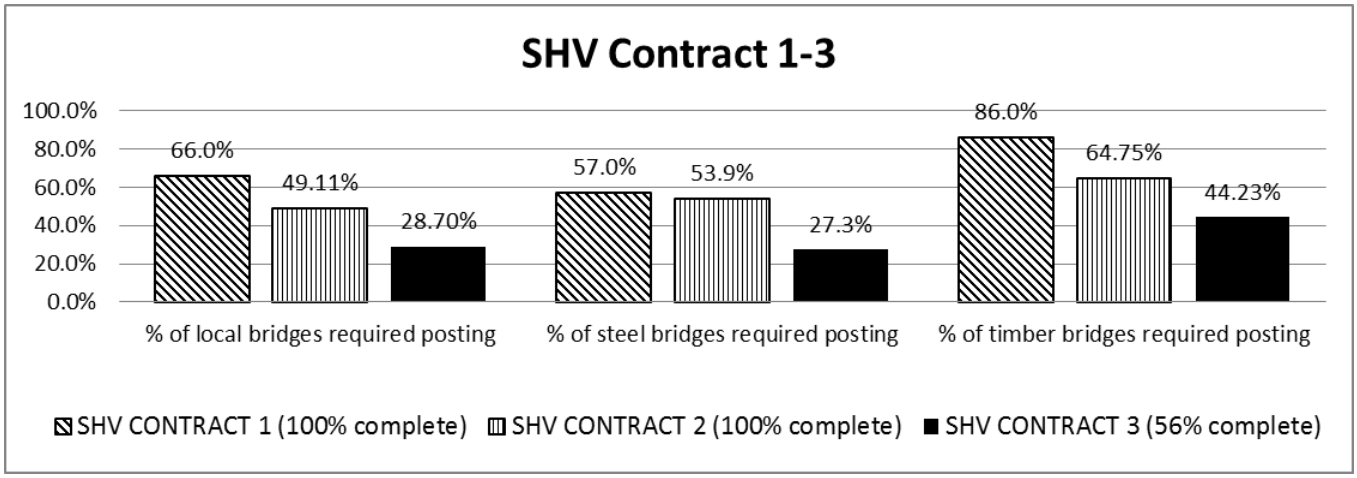
Local Bridge Load Rating and Permitting Update

Specialized Hauling Vehicles

The first and second SHV load rating contracts have been completed. There were 581 local bridges in contract 1 and 729 local bridges in contract 2 that were load rated for SHVs (legal 4-7 axle single unit truck with up to 78,000 lbs gross vehicle weight, and when fully loaded can produce significantly more stress on our local bridges than legal semi-trucks). The evaluation of the top 1,000 local bridges with highest priority and most susceptible to SHVs were addressed in these first two sets of contracts. Of the 1,310 bridges that were evaluated, 56% required load posting. It was the short span timber and steel beam bridges that required the large percentage of the load posting.

The third SHV load rating contract is currently underway. Due to the high number of bridges, the contract was divided into five separate consultant contracts to perform the load rating and posting analysis. The team of consultants includes LHB, SRF, WSB, TKDA and HDR. They will load rate approximately 770 total local bridges. More than half of the bridges that are in this contract are short span timber slab and steel beam bridges. The heaviest concentration of the work is located in the southern half of the state, but the impact of the project is statewide affecting 86 counties.

To date, 432 of the 770 local bridges have been evaluated and 124 bridges (29%) required load posting. So far the contract looked at approximately 208 timber slab bridges and 77 steel beam bridges. 45% of the timber bridges and 27% of the steel beam bridges required load posting. Once again, the short span timber and steel beam bridges were most affected by the SHV trucks. This recent number further validates the vulnerability of timber bridges to the SHV trucks and the growing need to remove, repair, rehabilitate or replace these bridges. As we continue to make significant progress annually in updating statewide local bridge load ratings for SHV's, the number of posted bridges should decrease as presented in the bar graph below.



Finally, work has also begun on our fourth SHV load rating contract. This contract calls for another five local bridge consultants to load rate approximately 890 local bridges. The contract is now being prepared to be advertised by the middle of January. We also have funds for SHV Contract 5 that will include approximately 663 local bridges for fiscal year 2015.

Specialized Hauling Vehicle, SU7 (Single Unit 7 Axles) Shown

Regarding future work, our State Aid Bridge Load Rating & Permitting Engineer, Moises Dimaculangan (moises.dimaculangan@state.mn.us) will continue to refine the list of remaining bridges requiring SHV evaluation, and work to develop the next two sets of consultant contracts for 2015-2016 and beyond.

Note, the FHWA issued a memorandum dated November 15, 2013 to clarify their national position on the evaluation of SHVs. The FHWA recognizes that there are bridges in the inventory that have not been rated for SHVs and that it is not feasible to include SHVs in the ratings for the entire inventory at once. The FHWA has established the following timeline for rating bridges for SHVs. For bridges with the shortest span not greater than 200 feet should be re-rated after their next NBIS inspection, but no later than December 31, 2017. This timeline will be incorporated into the review of Metric 13 under the NBIP. The FHWA recognizes that Minnesota has engaged in SHV evaluations for years now, and is well ahead of other states in meeting this aggressive timeline. SALT Bridge and the Bridge Office will continue to work with the FHWA and local bridge owners to complete the SHV evaluations for our entire local bridge inventory as soon as reasonably possible.

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...continue, Local Bridge Load Rating and Permitting Update

As stated in the 2013 State Aid Newsletter, all local bridges that are compatible with the AASTHOWARE Virtis software will be load rated using the program. With a significant demand to permit overweight loads on local roads, building the Virtis database will help establish a local bridge permitting process and eventually could lead to a statewide permitting program similar to the state bridge permitting program.

Virtis Load Rating Program

Virtis is a state-of-the-art bridge load rating program released by AASHTO. It can rate bridges in load factor rating, load resistance factor rating and allowable stress rating method. It has the ability to rate a variety of structure types and configurations. It stores detailed descriptions of each bridge sufficient for structural analysis.

Getting bridges in Virtis database will be very advantageous for local bridge owners. It will give the local bridge owner and their bridge consultants the ability to quickly analyze legal and permit loads. It would also give them the ability to quickly obtain load ratings based on changing bridge condition, changing overlay-gravel thickness, changing truck weights and laws, changing federal load rating methods and regulations, etc. Having Virtis models that can be repeatedly used for bridge evaluation is an effective approach to enhance uniformity for permit review. It will reduce turnaround time for permit review, allow for more effort on examining other alternatives for approving the permit, and provide more consistent and accurate results.

A majority of our local bridge consultants have the Virtis load rating program and are now load rating all compatible local bridges with Virtis. To keep building the Virtis data base and for the reasons stated above, all new local bridges should be load rated with Virtis. For questions and support with Virtis, please contact Moises Dimaculangan at moises.dimaculangan@state.mn.us or 651-366-4522.

Local Bridge Permitting

Oversize/overweight vehicle permitting is operated through a highly complex system that involves many agencies at the state and local levels. Minnesota, as well as other states nationwide, currently lacks a viable and sustainable permitting process for local bridges. Minnesota county engineers as well as the trucking industry has a strong interest in enhanced uniformity of a statewide local bridge oversize/overweight permitting process/program. The idea is to develop a permitting process to adapt to the current MnDOT permitting process, and which will allow seamless permitting between state and local routes.

There are approximately 10,464 non-posted local bridges (including culverts) that are open to traffic, and that will eventually require some sort of load rating analysis to evaluate SHVs (see Table 1). So far, 1,866 local bridges have been programmed into Virtis since the beginning of the SHV load rating contracts. The county engineers understand that in order to have a viable and sustainable permitting process for local bridges, it will require to have all non-posted local bridges that are compatible with Virtis be analyzed and entered into Virtis. This task could add roughly another 5,878 local bridges beyond the bridges being load rated under the SHV load rating contracts 1 through 5 (see Table 2). It would require an addition of $5-$6 million consultant contracts to validate inspection and to load rate these bridges in Virtis.

For the evaluation of the 4,549 local culverts that is not compatible with Virtis, the cost to get these evaluated for SHVs is approximately $4 million. For the 37 local bridges that is not compatible with Virtis, the cost is unknown since these are typically major structures that may or may not be susceptible to SHVs (see Table 3).

Table 1:

Number of local bridges & culverts open to traffic, span length ≥ 10ft

Route system	No.
COUNTY:	1,324
CSAH:	3,844
MSAS:	297
MUN:	363
TWNS:	4,636
Total =	**10,464**
Total No. of culverts =	9,352
Total No. of bridges =	1,112

Table 2:

Number of local bridges & culverts compatible with Virtis, span length ≥ 10ft

Route system	No.
COUNTY:	730
CSAH:	2,317
MSAS:	207
MUN:	209
TWNS:	2,415
Total =	**5,878**
Total No. of culverts =	4,803
Total No. of bridges =	1,075

Table 3:

Number of local bridges & culverts not compatible with Virtis, span length ≥ 10ft

Route system	No.
COUNTY:	594
CSAH:	1,527
MSAS:	90
MUN:	154
TWNS:	2,221
Total =	**4,586**
Total No. of culverts =	4,549
Total No. of bridges =	37

Note: Table 1 thru 3 does not include bridges that are included in SHV load rating contracts 1 through 5 (3,652 total bridges). Minnesota defines a bridge as a structure 10 feet or greater in length.

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…continue, Local Bridge Load Rating and Permitting Update

However, not all local/state bridges are compatible with Virtis, such as trusses, steel curved beam bridges, steel and concrete pipe arch culverts, timber box culverts, etc. Today, MnDOT uses a combination of Virtis, existing load rating report information, permit truck charts, rules of thumb, etc. to permit state bridges. This process can also be applied on the local system.

Culvert permitting

Currently, there is no process that exists for permitting overweight trucks on local culverts. Extensive national efforts are being made to address this dilemma. There are approximately 9,352 culverts on the local system. Load rating culverts using Virtis has its limitation. The current version of Virtis 6.4 only has the ability to load rate cast-in-place and precast reinforced concrete culverts. Due to an overwhelming number and different types of local bridge culverts statewide and the limitation of the Virtis program, culvert permitting will be a challenge. A possible way to handle this current issue is to have the county engineers designate a finite number of hauling/primary routes and for MnDOT Bridge Office and SALT Bridge to develop guidelines and criteria to load rate/post local culverts that will provide a uniform level of safety for permitting overweight trucks.

For load rating corrugated metal culverts, FHWA has suggested to use a spreadsheet called CMP_excel which was developed by Ohio DOT.

Overweight Permitting Process update

In the last couple of years, the number of overweight permit requests on local roadways has increased as the trucking industry is choosing to use local roads more and more to transport overweight loads to save time and money. Currently, there is no standard operating procedure for the application of overweight/oversize vehicle on Minnesota local roadway system. The current local permitting practice that exists today is done multiple ways. One, the load rating and permitting analysis is done by an independent local consultant engineering firm. The bridge owner will request that the trucking applicant hire a consultant to perform the analysis. Another is for the bridge owner to simply deny the permit. And finally, the permit process is occasionally performed with the help from the State Aid Bridge Load Rating & Permitting Engineer. This process is done using a combination of Virtis analysis, existing load rating report information, inspections report, permit truck charts and an in-house spreadsheet developed by MnDOT Bridge Load Rating Unit. Once the analysis is complete, possible recommendations are sent back to the bridge owner. Recommendations may include one or a combination of following statements:

- Drive on the centerline, occupying two lanes
- Maximum speed of 10 miles per hour when driving over the bridge
- Drive on the centerline, occupying two lanes and maximum speed of 10 miles per hour, POLICE ESCORT REQUIRED
- DENIED, vehicle not allowed on the bridge

The current State permitting process is done through the Office of Freight and Commercial Vehicle Operations located in St. Paul by online, fax or in person. The permit office will evaluate the permit and generate a route. The route is then sent to the Bridge Office via e-mail for evaluation. The Bridge Office will then evaluate the bridges on the route to ensure that damage to the State's bridges does not result from the proposed overweight vehicle and to ensure the safety of the travelling public. Once the analysis is complete, the Bridge Office will notify the permit office if the truck will be allow to cross the bridges or provide restrictions/denials before the OFCVO issues the permit.

State Aid Bridge

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